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Towards We-Government: Collective and participative approaches for addressing local policy challenges

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WeGovNow: an integrated platform for social engagement in shaping future cities

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***Abstract*—We describe WeGovNow, an Horizon 2020 European Union project involving twelve partners from Germany, Sweden, Greece, Italy and United Kingdom, aimed at using state-of-the-art digital technologies in community engagement platforms to involve citizens in decision making processes within their local neighbourhood. Different software components were developed and integrated in a single web platform offering an homogeneous experience to the users, and enabling the collection and the use of crowd mapped information.**

***Index Terms*—Geographic visualization; Collaborative content**

I. Introduction

In the last years many expectations have been built around the creation of services for citizen coordination, collaboration, cooperation, and re-use of public sector information.

WeGovNow [1] is a joint effort platform made of several software components and supports the transition from "e-Government" (citizen as customer) to "We-Government" (citizen as partner) [2]. With WeGovNow, citizen are able to to report problems and suggest improvements, to discuss their relevance, explore ways to fix problems through collective action, find solutions to compensate for resource shortages , debate topics of strategic nature, and develop and vote upon concrete suggestions for local policy action.

Within WeGovNow platform, all the different components interact and converge to create a modern volunteered geographic information system fostering collaboration between citizens and a smooth and streamlined communication channel with their municipalities.

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II. The Global Infrastructure of WeGovNow and its single components

To develop a digital platform for effectively engaging local civil society in the co-production of citizen-centred services and in the co-development of strategic approaches to community development the main objectives are:

- Display user activities on a user-friendly, map-based interface, according to their preferences, location and time
- Allow users to interact with each other using social network features
- Enable the integration and presentation of any relevant open public sector information (PSI) increasing the user awareness on community interests
- Effectively support collective formation of opinions
- Automatically match users and their concrete requests and offers

The WeGovNow platform reaches all these requirements by using the leading edge technologies in the area of collective peer-production, volunteered geographic information (VGI), re-use of open PSI, and collective opinion formation. It is deeply interlinked with existing crowd-sourcing and open data repositories and the participating stakeholders' IT systems, complementing the ICT infrastructures already existing in the participating municipalities rather than replacing them. This is done by offering a well-defined layer of semantic knowledge representation, integration and communication offered by OnToMap [3].

Actually, WeGovNow includes five different components:

1) FirstLife: a platform for Computer Supported Cooperative Work based on a map-based social network where citizens can collaborate in mapping the city and share different points of view about the same urban entities. Users can explore the data according to time and space dimensions, in terms of different scales using a timeline and an interactive map.

2) ImproveMyCity: it enables residents to report, to the public administration, local issues on their neighbourhood [4]. The reported issues are automatically transmitted to the appropriate department in the public administration to schedule their settlement, while their progress is publicly traceable.

3) LiquidFeedback: is the collective opinion formation and participatory decision making component that can be used to organize discussions among stakeholders and allow citizens to express their opinions. This is done in a transparent process, using collective moderation, proxy voting and preferential voting [5]. It is based on different and customizable phases, from deliberation, discussion and preferential voting.

4) Community Maps: is a flexible and stylish participatory mapping frontend to visualize data, compare information, and encourage conversation about the places which matter. It uses the GeoKey public REST API to allow project administrators the design of the structure of the map content.

5) Offers and requests: it implements a marketplace for goods and services that can suggest posts to users based on their interests, and also to match requests offering support or cooperation based on trust among the participating parties.

III. Integration of the different components

One of the aims of this project is to integrate seamlessly different components creating a homogeneous user experience without having to rewrite completely already existing software. The platform has been realized via a layered architecture approach which integrates the previously described components within the overall system in conjunction with:

- a mechanism for orchestrating user management such as registration, single sign-on authentication, profile handling and in general trusted accreditation provided by LiquidFeedback (UWUM)
- a mechanism for keeping track of actions in a unified manner across components (OntoMap [3] and its Logger)
- a common entry point for the whole platform providing a map-based overview of the current status of the application (LandingPage)

Each of the individual software applications that have been integrated into the overall platform has its inner coherence in terms of data, functionalities and interfaces. However, in terms of WeGovNow platform components they have been harmonized to add value beyond their implementation as standalone solutions.

Having a distributed system made of different components that interact together via two well defined hubs (UWUM and OntoMap) made it possible to proceed with the development separately across different consortium members and being able to obtain a single integrated web page even if some of the underlying technologies are different.
More in details, we report the list of shared services offered by the WeGovNow core infrastructure to all components.

OnToMap and OnToMap Logger are used as a container of Open Data, as a cross-application data integrator, and as a centralized user activity logger for tracking user activities. The data integration support underlining all these functions is achieved via a semantic knowledge representation layer which supports the mapping of heterogeneous domain conceptualizations to a common terminology. This terminology, defined in the OntoMap ontology, is used for generating a unified user activity log that captures the actions performed by users in all WeGovNow applications and an integrated view on the information about geographical objects shared by them.

InputMap is a unified location map-based module developed to input spatial coordinates within different components: it improves the overall look and feel by adopting a common solution platform-wide. *AreaViewer* is used to provide a map based view of the data aggregated by OnToMap. It's used in the Landing Page, the initial webpage shown to the users.

TileServer is the common source of geographical data used to render an interactive layer on a web map: it provides a fast and standard access to web map components.

Shared User Login is a single authentication server by LiquidFeedback, implemented via the Unified WeGovNow User Management (UWUM). It allows users to access all the components with a single login. The availability of a common navigation bar and a discovery service *Profile and Style Services* allows application to offer a unified user experience.

pgLatLon is a spatial database estension for PostgreSQL providing geographic data types and spatial indexing for the WGS-84 spheroid.

The *Data Quality Assessment* Data quality is one of the most important factors for success of E-Government solutions. A data quality concept for the WeGovNow platform was developed. Data quality is assessed intrinsically and comparably, by using OpenStreetMap and Open data. A Geo-Spatial Data Repository [6] web service is available to the consortium in form of interactive maps.

In conclusion, the main development phase of WeGovNow has ended, the platform is being tested in three pilot municipalities of Turin, Southwark, and San Don di Piave and this will lead to bug fixes and further tailoring of the platform to the real needs of the involved participants. The outcome will be evaluated, in terms of viability and sustainability, on the technical and social aspects, involving stakeholders such as municipalities, citizens, NGOs and local businesses. To the best of our knowledge no other single open source platform offers such functionalities related to civic engagement.

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